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Cold-sensitive growth phenotype of some supersuppressor strains of Neurospora crassa

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Abstract

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The growth rates of a number of supersuppressor strains were determined in race tubes at 25 and 10° C to investigate whether any exhibited a cold-sensitive growth phenotype. Each race tube was inoculated with a conidial suspension and the lateral mycelial extension was marked at regular time intervals. All of the strains exhibited an approximately wild-type growth rate at 25° C. The steady-state growth rates for the supersuppressor strains and for the wild-type control at 10° C on both Vogel's complete and Vogel's minimal medium are presented in Table 1.

Table 1

Growth rates of supersuppressor strains and the wild-type in race tubes at 10° C

Strain	(FGSC#)	Growth rate (mm/hr) Minimal	Complete
74A		0.68 (100)*	0.68 (100)*
ssu-1(?) a	(1750)	0.31 (46)	0.36 (53)
ssu-1;am A	(1687)	0.23 (34)	0.46 (68)
ssu-2;am A	(1689)	0.18 (27)	0.57 (84)
ssu-3;am a	(1851)	0.22 (33)	0.54 (80)
ssu-4;am A	(1852)	0.25 (37)	0.29 (43)
ssu-5 a	(1751)	0.32 (47)	0.42 (62)
ssu-6 A	(1748)	0.58 (85)	0.71 (104)

*% of wild-type rate on that medium.

At the gross observation level, it is significant to note that ssu-1(?) a on complete and ssu-3;am a on minimal showed a fairly regular "start-stop" type of growth, and strain ssu-2;am A exhibited very erratic growth characteristics on minimal. Thus the growth rates presented in Table 1 for these strains must be considered to be approximate.

If I arbitrarily consider a strain to be cold-sensitive if it exhibits a growth rate of 50% or less of that of the wild-type, then only ssu-4;am A is cold-sensitive on complete medium. By contrast, all of the strains except ssu-6 A are cold-sensitive on minimal medium. I conclude therefore, that the growth phenotype of these strains is medium-dependent. Nevertheless, it is interesting to note that most of the strains are cold-sensitive on the type of medium (minimal) that is used for testing the supersuppression phenotype (see, for example, Seale 1976 Mol. Gen. Genet. 148: 105).

My main interest in the cold-sensitive nature of these

strains stems from the possibility that their supersuppression phenotype is the result of altered ribosomes. Analysis of the ribosomes synthesized by the cold-sensitive strains on minimal medium at 10° C showed that the two subunits are made in wild-type proportions. Two-dimensional acrylamide gel electrophoresis experiments are currently being done to investigate whether altered ribosomal proteins can be detected in the strains. (This research was supported by NSF and NIH grants). - - - Department of Biology, Reed College, Portland, Oregon 97202.